DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the possible frame transfer approach of the terminal in
LAN connecting with the network where two or more terminals differ in coincidence especially about
the control at the time of a remote place carrying out network HERIMOTO access through a proxy
(Proxy). A "proxy" is written on these specifications. ["Proxy"]
[0002]
[Description of the Prior Art] Drawing 5 is drawing showing the example of the configuration of the
conventional frame transfer approach, and shows the example by the middleware method. The figure in
the parenthesis in this drawing shows transfer and control of a signal, and corresponds with the
description under following explanation. clear also from drawing -- as -- this configuration -- a terminal
51 -- an access line -- going -- access equipment 52 -- connecting -- the network 53 of plurality
[equipment / 52 / access] -- 54 HE connection is made.
[0003] The middleware for connecting with a terminal 51 at access equipment 52, and acquiring a
connection identifier (SESSION-ID) is mounted. This example is the middleware method which
connects to the ***** direct access device 52 the middleware mounted in the terminal 51, and a
terminal 51 acquires a connection identifier (SESSION-ID) from access equipment 52 (1-1). Moreover,
a terminal 51 acquires a global address from a network (1-2).
[0004] When a terminal 51 transmits a data frame to a network, a connection identifier is attached to a
global address, a data frame is transmitted to access equipment 52 (1-3), and access equipment 52 is
transmitted to the corresponding network (1-4). When a network transmits a terminal 51 HEDETA
frame, a network attaches the global address which a terminal 51 has as a destination address, and
transmits it to access equipment 52, and access equipment 52 transmits a data frame to a terminal 51.
[0005] Drawing 6 is drawing showing other examples of the configuration of the conventional frame
transmittal mode, and shows the example using a proxy PPP method. (reference -- -- [-- Cohen -- R . -- ",
-- Service -- -- provisioning in an ATM-over-ADSL access network -- " -- IEEE Communications -- --
Magazine -- Vol . -- 37 -- pp -- 82 - 87 (Oct.1999) --] -- reference .)
[0006] The configuration drawn on drawing 6 is a proxy method which two or more terminals formed
LAN66, and this LAN has connected to a proxy 65. A proxy 65 has a function equivalent to the function
of the middleware mounted in the terminal 51 of drawing 5 , and has the function connected to access
equipment 62 as a substitute of a terminal.
[0007] Terminal 61a performs the connection request to networks 63 or 64 to a proxy (2-1). A proxy 65
acquires a connection identifier (SESSION-ID) from access equipment 62 (2-2), and a proxy 65 acquires
a global address from a network (2-3).
[0008] Moreover, when it has a terminal identification child in each and Terminals 61a and 61b transmit
a data frame to a network, a terminal follows the terminal identification child of a local station, delivery
(2-4) and a proxy 65 change a terminal identification child into a proxy 65 as a router at a global address
(2-5), and each terminals 61a and 61b attach a connection SHIYON identifier, and transmit it to access

equipment (2-6).

[0009] When a network transmits a data frame to Terminals 61a and 61b, a network attaches the global address which a proxy 65 has in a data frame as a destination address, and transmits it to a proxy via access equipment 62 (2-7). A proxy 65 changes the global address of a destination address into a terminal identification child (2-8), and transmits a data frame to a terminal (2-9).

[0010]
[Problem(s) to be Solved by the Invention] In a Prior art which was mentioned above, by the middleware method shown in drawing 5 , since middleware was dependent on environments, such as OS of a terminal, the technical problem that two or more kinds in all of middleware had to be developed was in the environment of a terminal.

[0011] on the other hand, dependent [by using a proxy] on environments, such as OS of a terminal, by the conventional proxy method shown in drawing 6 -- things -- < -- although the terminal became possible [the thing which chose it as arbitration and for which network WAKUHE connection is made], there was a problem that two or more terminals could not connect with a network which is different in coincidence.

[0012] Two or more terminals connect with a network which is different in coincidence, it is possible to transmit and receive a data frame and this invention aims at offering the frame transfer approach using the proxy which performs an authentication demand automatically further at the time of the connection request of a terminal in order to solve these technical problems.

[0013]
[Means for Solving the Problem] According to this invention, an above-mentioned technical problem is solved by the means indicated to said claim. That is, it is the configuration that two or more terminals form LAN, the proxy (Proxy) connected to this LAN connects with access equipment via an access line, and this access equipment is connected to two or more networks, said terminal is the frame transfer approach of transmitting a data frame between said networks via said proxy, said access line, and said access equipment, and invention of claim 1 is [0014]. Said two or more terminals have a terminal identification child in each, and this each terminal performs the connection request to said network to said proxy. This proxy A connection identifier (SESSION-ID) is acquired from said access equipment. Moreover, this proxy A global address is acquired from said network, and this proxy creates the translation table of the terminal identification child of the terminal of connection-request origin, and said global address, and the correspondence table of this terminal identification child and said connection identifier is created, and it is [0015]. This proxy changes said terminal identification child of said data frame into a corresponding global address using said translation table by adding the terminal identification child of a local station to said proxy, and transmitting to it, when said terminal transmits a data frame to said network, and the connection identifier corresponding to said terminal identification child is added using said correspondence table, said data frame is transmitted to said access equipment, and it is [0016]. It is the frame transfer approach of said network giving said global address to this data frame as a destination address, and transmitting to said access equipment when transmitting a data frame to said terminal, this access equipment transmitting said data frame to said proxy, and this proxy changing the global address of the destination address of this data frame into the terminal identification child who corresponds using said translation table, and transmitting said data frame to the corresponding terminal.

[0017] Invention of claim 2 memorizes beforehand the authentication information which connects a proxy to said network on the connection table in said frame transfer approach according to claim 1. Said proxy A connection identifier is acquired from said access equipment at the time of the connection-request reception to said network from said terminal. When said authentication information corresponding to said network is taken out from said connection table, an authentication demand is performed to said access equipment and it succeeds in authentication, it constitutes so that said global address may be acquired.

[0018] By mounting middleware in a terminal, the conventional middleware method was constituted so that a terminal might connect with a direct access device. On the other hand, by the conventional proxy

method, although two or more terminals were connectable with one network, it was not connectable with a network which is different in coincidence.

[0019] On the other hand, it differs in that the approach of this invention performs a frame transfer in a proxy method using a translation table and a correspondence table. The effectiveness it is ineffective to two or more terminals being able to connect with a network which is different in coincidence by this is acquired. Furthermore, by the frame transfer approach of claim 2, when a terminal carries out a connection request, the effectiveness which attests to a network automatically and is connected is acquired.

[0020]
[Embodiment of the Invention] Below, the gestalt of operation of this invention is explained to a detail using a drawing. Drawing 1 is drawing showing the example of the gestalt of operation of this invention, and shows the block diagram of remote network access using a proxy. Using PPPoE (PPP over Ether) and L2TP (Layer 2Tunneling Protocol) as the remote access approach to a network, a user chooses a network as arbitration and connects.

[0021] PPPoE to which the PPP frame flows the Ethernet top which serves as an access line to LAC (L2TP Access Concentrator)3 which serves as access equipment from a proxy 2 It connects. LNS (L2TP Network Server) is a L2TP tunnel via a junction IP network from LAC.

[0022] It connects with two or more LNS 5a and 5b from LAC3, and in drawing 1 , temporarily, it is referred to as LNS#1 (figure sign 5a shows) and LNS#2 (figure sign 5b shows), and the network connected previously is further set to network #1 (figure sign 6a shows) and network #2 (figure sign 6b shows).

[0023] LNS carries out termination of the L2TP tunnel, processes the PPP frame, and hands it over to the network hosts (Host) 7a and 7b. The inside of proxy 2 subordinate's local NW (Local Area Network) serves as LAN connected by Ethernet. In drawing 1 , temporarily, two or more terminals are used as Terminals a and b, give P-IP (brei bait IP address) which serves as a terminal identification child to each terminal, and install a proxy 2 as a default gateway.

[0024] For drawing 2 , two or more terminals are PPPoE. Establishment to PPP Connection authentication is carried out and they are a translation table and drawing showing the sequence to correspondence table creation. The terminal b with P-IP address B made into the terminal a with P-IP address A made into a brei bait IP address and a brei bait IP address constitutes Local NW (local network), and the sequence diagram of drawing 2 is connected to the proxy.

[0025] It connected with LAC from the proxy and connected with LNS#1 and LNS#2 from LAC, respectively, and LNS#1 is connected to network #1, LNS#2 are connected to network #2, and this is the same configuration as drawing 1 . First, the terminal a with P-IP address A performs a connection request to a proxy to network #1. A proxy is PPPoE to LAC. A connection is established.

[0026] At the time of connection establishment, a proxy acquires SESSION-ID#1 used as a connection identifier from LAC. Next, a proxy acquires G-IP address A (global IP address) which becomes the global address of network #1 from LNS#1 with PPP connection LNS#1. A proxy creates the translation table of P-IP address A of a terminal and G-IP address A which carried out the connection request (4-1), and creates the correspondence table of P-IP address A and SESSION-ID#1 (4-2).

[0027] The terminal b which has P-IP address B in the same procedure performs a connection request to a proxy to network #2. A proxy is PPPoE to LAC. A connection is established. And a proxy acquires SESSION-ID#2 which become a connection identifier from LAC at the time of connection establishment. Next, a proxy acquires G-IP address B (global IP address) which becomes the global address of LNS#2 ** RINETTO work-piece #2 with PPP connection LNS#2.

[0028] A proxy creates the translation table of P-IP address B of a terminal and G-IP address B which carried out the connection request (4-3), and creates the correspondence table of P-IP address B and SESSION-ID#2 (4-4). The created translation table (4-3), a correspondence table (4-4) and a translation table (4-1), and a correspondence table (4-2) are set, and it considers as an address translation table (4-5) and the table (4-6) corresponding to SESSION-ID.

[0029] Thus, Terminals a and b connect with a network different, respectively, and the address

translation table (4-5) of the pair for communicating and the table (4-6) corresponding to SESSION-ID are created.

[0030] Drawing 3 is drawing showing the sequence of the approach a proxy subordinate's terminal communicates with a network. The terminal b with P-IP address B made into the terminal a with P-IP address A made into a brei peat IP address and a brei peat IP address constitutes Local NW (local network), and the sequence diagram of drawing 3 is connected to the proxy.

[0031] It connected with LAC from the proxy and connected with LNS#1 and LNS#2 from LAC, respectively, and LNS#1 is connected to network #1 and LNS#2 are connected to network #2. This is the same configuration as drawing 1 . First, how to communicate only within local NW is explained.

[0032] When communicating among Terminals a and b, the MAC Address of a destination terminal is acquired by ARP (Address Resolution Protocol), and the direct communication of the destination is specified and carried out by the MAC Address. Next, when Terminal a communicates to network #1, it transmits to the proxy which is a default gateway (5-1). A proxy changes a transmitting agency address P-IP address into G-IP address using an address translation table, attaches SESSION-ID corresponding to Terminal a, and sends it to LAC.

[0033] When receiving data from network #1, a proxy changes the destination address G-IP address of a receiving frame into P-IP address using a translation table, and transmits to Terminal a. Terminal b becomes possible [communicating by the same approach and communicating with the network chosen for every terminal].

[0034] Drawing 4 is the sequence diagram to PPP connection of the network at the time of carrying out a connection request from a terminal which used the connection table. In this drawing, Terminal a and Terminal b constituted Local NW (local network), and have connected with a proxy. It connected with LAC from the proxy and connected with LNS#1 and LNS#2 from LAC, respectively, and LNS#1 is connected to network #1 and LNS#2 are connected to network #2. This is the same configuration as drawing 1 .

[0035] Authentication information consists of element information on [a user name, a network name, and Password]. In the authentication information on [A, net#1, Pasword #1] network #2, authentication information on network #1 is set to [B, net#2, Password#2], and such authentication information is memorized [information] by LNS#1 and LNS#2, respectively. Moreover, a proxy holds such authentication information corresponding to a network as a connection table, and manages it.

[0036] When Terminal a advances a connection request to network #1 (LNS#1), it is PPPoE between a proxy and LAC first. A connection is established and SESSION-ID#1 of Terminal a is acquired from LAC. For example, by the command, the network of arbitration to connect using the connection request of Terminal a, Web, etc. is inputted into a proxy, as shown in [network #1].

[0037] Since the authentication information for making network WAKUHE connection that it corresponds to a command beforehand is memorized as a connection table, at the time of command input, the authentication information on [A, net#1, Password#1] corresponding to a command [network #1] is taken out in a proxy from a connection table (6-1), and an authentication demand is given to it to LNS#1. When authentication is successful, the G-IP# address A is acquired from LNS#1.

[0038] The proxy concerning the frame transfer approach of this invention is realizable easily using a terminal, a personal computer, etc. Moreover, it is possible to also make the terminal of either of the LANs have a function as a proxy.

[0039]
[Effect of the Invention] As mentioned above, as explained to the detail, in case a remote place carries out network HERIMOTO access according to this invention, a proxy uses a translation table and a correspondence table and is performing the frame transfer. The effectiveness it is ineffective to two or more terminals being able to connect with a network which is different in coincidence by this is acquired.

[0040] moreover, a proxy -- authentication information -- a connection table -- beforehand -- memorizing -- < -- by things, a terminal has the advantage which can attest to a network automatically and can be connected while being able to carry out the network WAKUHE connection request chosen as

arbitration.

[Translation done.]

CLAIMS

[Claim(s)]
[Claim 1] With the configuration in which two or more terminals form LAN, the proxy (Proxy) connected to this LAN connects with access equipment via an access line, and this access equipment is connected to two or more networks Said terminal is the frame transfer approach of transmitting a data frame between said networks via said proxy, said access line, and said access equipment. Said two or more terminals have a terminal identification child in each, and this each terminal performs the connection request to said network to said proxy. This proxy A connection identifier (SESSION-ID) is acquired from said access equipment. Moreover, this proxy A global address is acquired from said network. This proxy The translation table of the terminal identification child of the terminal of connection-request origin and said global address is created. Moreover, when the correspondence table of this terminal identification child and said connection identifier is created and said terminal transmits a data frame to said network, The terminal identification child of a local station is added to said proxy, and it transmits to it. This proxy Change said terminal identification child of said data frame into a corresponding global address using said translation table, and the connection identifier corresponding to said terminal identification child is added using said correspondence table. Said data frame is transmitted to said access equipment. Said network When transmitting a data frame to said terminal, said global address is given to this data frame as a destination address, and it transmits to said access equipment. This access equipment It is the frame transfer approach characterized by transmitting said data frame to said proxy, and for this proxy changing the global address of the destination address of this data frame into the terminal identification child who corresponds using said translation table, and transmitting said data frame to the corresponding terminal.
[Claim 2] It is the frame transfer approach according to claim 1 which acquires said global address when the proxy memorized the authentication information linked to a network beforehand on the connection table, said proxy acquires a connection identifier from access equipment at the time of the connection-request reception to said network from a terminal, the authentication information corresponding to said network is taken out from a connection table, an authentication demand is performed to said access equipment and it succeeds in authentication.
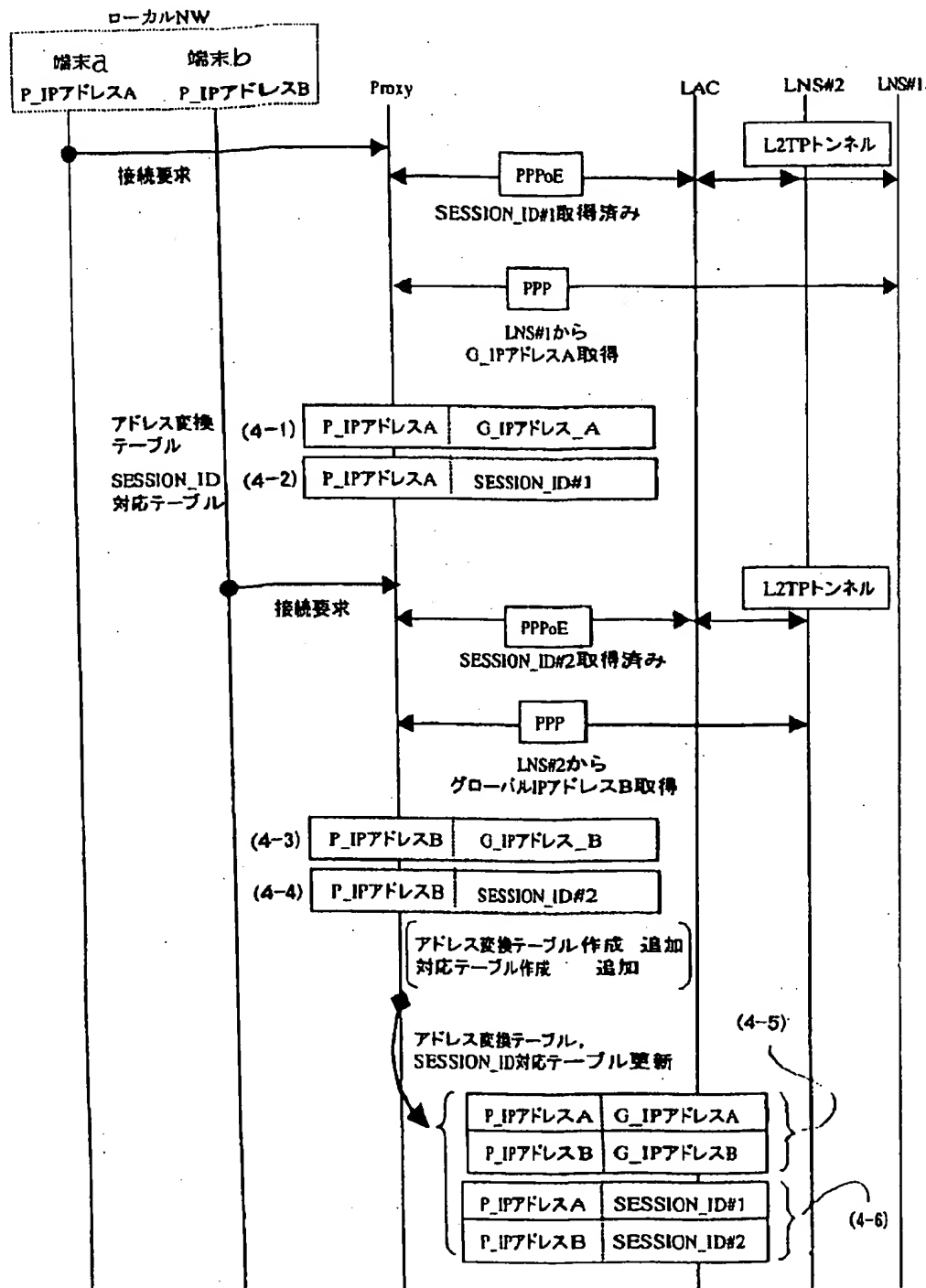
[Translation done.]

Drawing selection | drawing 1 | ▢

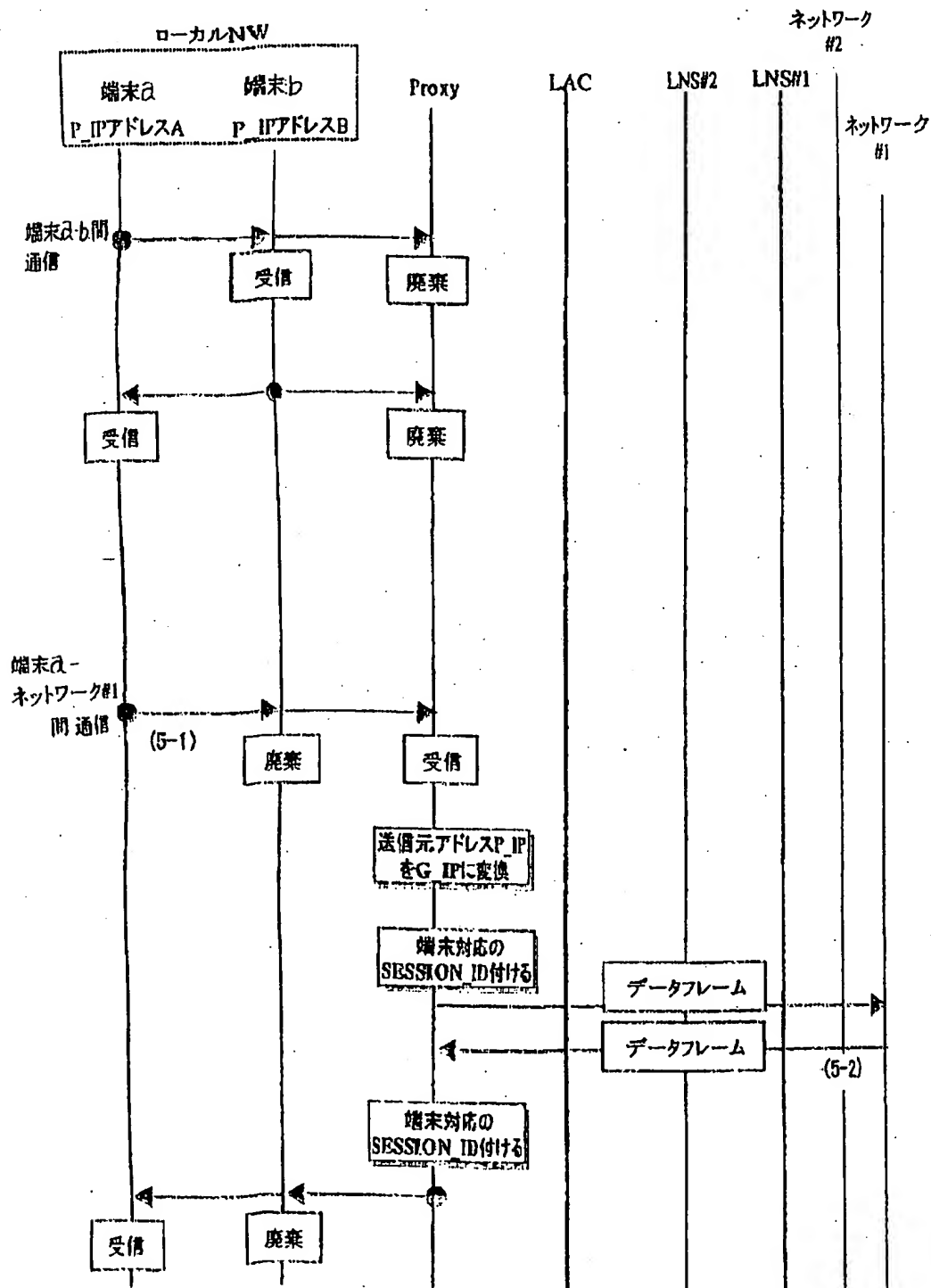本発明の実施の形態の構成の例を示す図
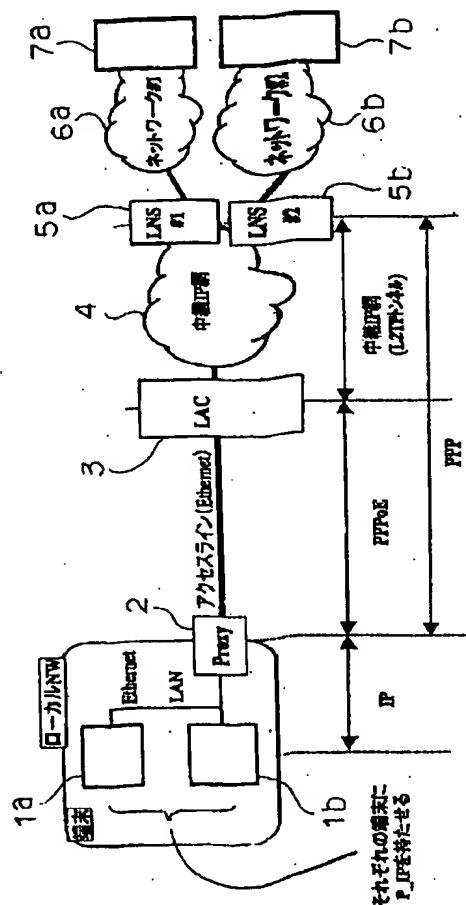
[Translation done.]

Drawing selection | drawing 2 |

本発明の複数端末がPPPoE 確立からPPP 接続認証し
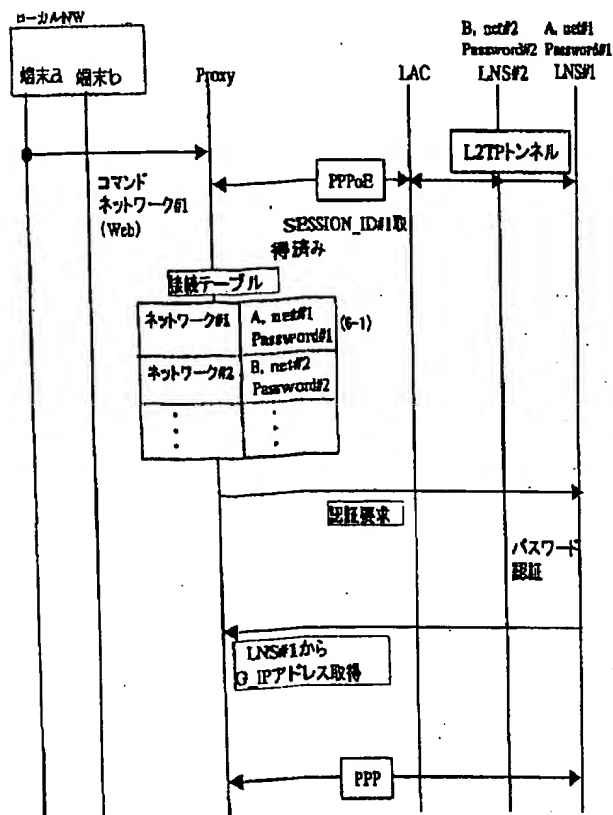## 変換テーブル、 対応テーブル作成までの シーケンスを示す図

ローカルNW

端末a　　　　端末b
P_IPアドレスA　P_IPアドレスB　　Proxy　　　　　　　　　LAC　　LNS#2　LNS#1

L2TPトンネル

接続要求　　　　　　　　PPPoE

SESSION_ID#1取得済み

PPP

LNS#1から
G_IPアドレスA取得

アドレス変換　(4-1)　| P_IPアドレスA | G_IPアドレス_A |
テーブル

SESSION_ID　(4-2)　| P_IPアドレスA | SESSION_ID#1 |
対応テーブル

L2TPトンネル

接続要求　　　　　　　　PPPoE

SESSION_ID#2取得済み

PPP

LNS#2から
グローバルIPアドレスB取得

(4-3)　| P_IPアドレスB | G_IPアドレス_B |

(4-4)　| P_IPアドレスB | SESSION_ID#2 |

アドレス変換テーブル作成　追加
対応テーブル作成　　　　追加

アドレス変換テーブル,
SESSION_ID対応テーブル更新

(4-5)

| P_IPアドレスA | G_IPアドレスA |
| P_IPアドレスB | G_IPアドレスB |

| P_IPアドレスA | SESSION_ID#1 |
| P_IPアドレスB | SESSION_ID#2 |

(4-6)

[Translation done.]

Drawing selection | drawing 3 |

本発明の代理端末配下の端末がネットワークと
通信する方法のシーケンスを示す図

ローカルNW

端末a　　　　端末b　　　Proxy　　　　LAC　　　LNS#2　　LNS#1
P_IPアドレスA　P_IPアドレスB

ネットワーク
#2

ネットワーク
#1

端末a-b間
通信

受信

廃棄

受信

廃棄

端末a-
ネットワーク#1
間通信　　(5-1)

廃棄

受信

送信元アドレスP_IP
をG_IPに変換

端末対応の
SESSION_ID付ける

データフレーム

データフレーム　　　(5-2)
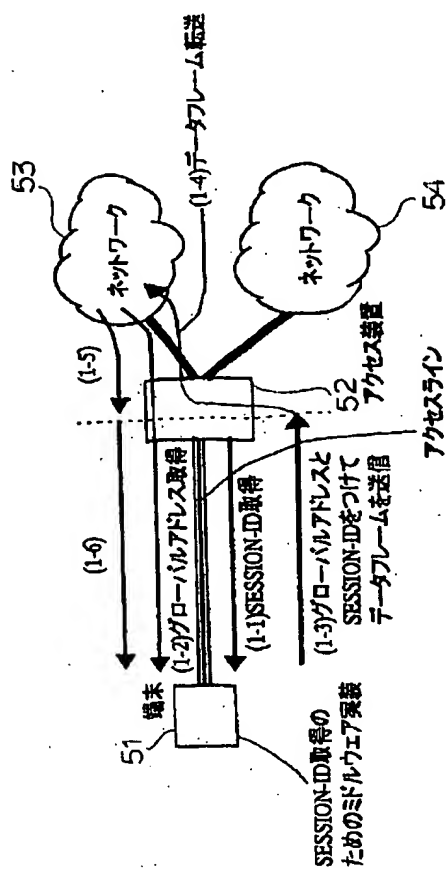
端末対応の
SESSION_ID付ける

受信

廃棄

Drawing selection ｜drawing 4　　　　　　　▼｜

本発明の接続テーブルを用いた端末から接続要求した場合の
　　ネットワークのPPP 接続までのシーケンスを示す図

[Translation done.]

Drawing selection | drawing 5 |

従来のフレーム転送方法の例を示す図

53 ネットワーク

54 ネットワーク

52 アクセス装置

51 端末

アクセスライン

(1-4)データフレーム転送

(1-5)

(1-6)

(1-2)グローバルアドレス取得

(1-1)SESSION-ID取得

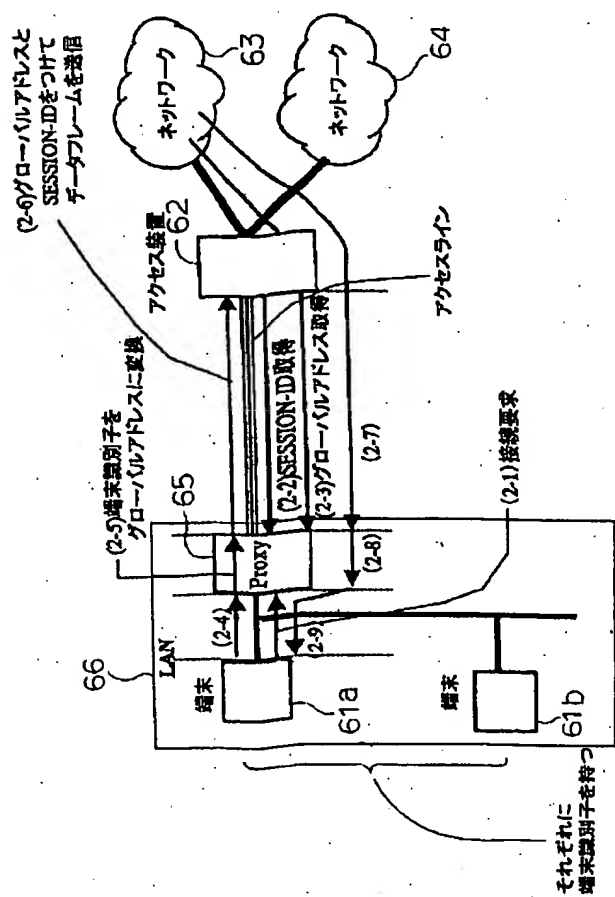(1-3)グローバルアドレスと
SESSION-IDをつけて
データフレームを送信

SESSION-ID取得の
ためのミドルウェア実装

[Translation done.]

Drawing selection | drawing 6

従来のフレーム転送方法の他の例を示す図

[Translation done.]